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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/814,023	03/31/2004	Dirk Blaine Forman	673.001	4954
29166	7590	06/29/2006		
PERRET DOISE A PROFESSIONAL LAW CORPORATION P.O. Box 3408 LAFAYETTE, LA 70502-3408				
			EXAMINER MENON, KRISHNAN S	
			ART UNIT 1723	PAPER NUMBER

DATE MAILED: 06/29/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No. 10/814,023	Applicant(s) FORMAN, DIRK BLAINE	
	Examiner Krishnan S. Menon	Art Unit 1723	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on 31 March 2004.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-26 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☐ Claim(s) 1-26 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)               | Paper No(s)/Mail Date. _____  |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                                    |

### **DETAILED ACTION**

Claims 1-26 are pending as originally filed

#### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-10 and 21-26 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 recites "said impeller vane", which has no antecedent basis.

Claim 3 introduces impeller and vanes. Therefore, impeller and vanes are not considered as recited in claim 1 for examination.

Claim 21 recites "the stream" which has no antecedent basis. It is considered as "the affluent" for examination.

#### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

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1. Claims 1-5 and 21-26 are rejected under 35 U.S.C. 102(b) as being anticipated by Keefer (US 4,230,564).

Claims 1 and 21: Keefer teaches an apparatus and a process for centrifugally separating an affluent stream using a membrane (see figures). The apparatus comprises a rotor cone cap (10), an inlet stream (84), a rotor bowl (12), connected to the rotor cone cap, and having an array of cavities (38) each having a membrane element, a permeate outlet (42), the apparatus having drive means (32) as claimed.

Claims 2 and 22: baffle plate (83).

Claim 3 and 23: impeller vanes (77,79 – figure 2)

Claim 4: spiral wound cartridge (column 5 lines 57 – 63)

Claims 5, 24 and 25: retentate outlet directing retentate radially inward – see 74 and 89. Permeate outlet radially outward – see 65, 87 and 69.

Claim 26: controlling back pressure by the pressure recovery turbine (column 6 lines 39-57).

2. Claims 1 and 21 are rejected under 35 U.S.C. 102(b) as being anticipated by Siwecki et al (US 4,333,832).

Siwecki teaches an apparatus and a process for centrifugally separating an affluent stream using a membrane (see figures). The apparatus comprises a rotor cone cap (at 28), an inlet stream (28), a rotor bowl (12), connected to the rotor cone cap, and having an array of cavities (10) each having a membrane

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element, a permeate outlet (16), the apparatus having drive means (18) as claimed.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Siwecki et al (US 4,333,832).

Siwecki teaches a centrifugal apparatus having an inlet stream, retentate and permeate outlet streams, arrays of cavities arranged at an angle to the horizontal (cantor: column 5 lines 61-66) and means for separating the impurities from the stream as claimed. The means plus function limitation invokes 35 USC 112, sixth paragraph, and accordingly, the means include what is specified by the applicant and equivalents thereof. The reference teaches spiral wound and hollow fiber membranes as the means (figures 4 and 5).

The reference does not specify the cantor angle. However, this angle does not seem to be critical according to the claims language, which recites a wide range of 10-60 degrees. The actual angle could be optimized for the appropriate flow of the "enriched brine" as explained by the reference (column 6 lines 14-31).

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4. Claims 5-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Keefer as applied to claims 1-5 and 21-25 above, and further in view of Siwecki et al (US 4,333,832).

Claim 11: the means plus function limitation for separating impurities from the stream invokes 35 USC 112, sixth paragraph, and accordingly, it would be limited by what is disclosed and equivalents thereof. The Keefer reference teaches this means as flat, tubular, spiral wound or hollow fiber membranes – column 5 lines 57-63.

Instant claims differ from the teaching of Keefer in the angle of the cavities to the horizontal, pressure regulating valve in the retentate outlet, thin film composite membrane, cellulose acetate membrane, etc. Keefer is silent on the angle, but in the pictures, which are described as schematic, the cavities appear to be horizontal. Siwecki teaches a cantor (incline or angle) for providing adequate flow for the enriched brine in column 5 lines 60-66 and column 6 lines 14-31 (see also the figures). It would be obvious to one of ordinary skill in the art at the time of invention to provide an angle to the horizontal or the vertical for the membrane cavities as taught by Siwecki in the teaching of Keefer to optimize the brine concentrate flow, without unduly increasing the power requirement. The cantor angle of 30-50 degrees is also a standard known for the cavities in a centrifuge as seen in the reference Kelley et al (US 3,880,592). Applicant has not disclosed any criticality of the angle in the specification.

Regarding the pressure regulating valve, the Keefer reference teaches using a pressure recovery turbine, which would function as a pressure regulating

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valve. Also, pressure regulating valves in the brine outlets are well known in the art of reverse osmosis. The membrane used, the thin film composite and the cellulose acetate are the most commonly used membranes in the reverse osmosis industry for water purification, and the supplier of the membrane in the Siwecki reference (UOP) is a known supplier of both kinds.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Krishnan S. Menon whose telephone number is 571-272-1143. The examiner can normally be reached on 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wanda L. Walker can be reached on 571-272-1151. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

A handwritten signature in black ink, appearing to read 'K S Menon', followed by the date '6/24/06' written in a similar cursive style.

Krishnan S Menon  
Examiner  
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